

WETLANDS

4-H Project Manual

Neil Crenshaw



This manual is intended to be used by both the 4-H volunteer leader and the 4-H member. Wetlands, 4-H Project Record, 4HMER71 should be used by the member in conjunction with this manual.

A Note To The 4-H Leader

In the back of this manual is a list of 16 mm films. The films are available on loan and may be borrowed either free of charge or, in some cases, for a small fee. Since the films are usually booked heavily, send in your request as early as possible. In most cases, a one-month advance notice is sufficient. Give an alternate date in case the film has been booked already for the date you wanted. Give the exact address to which the film is to be shipped. For further information concerning the films (cost, dates available, etc.) contact the organization listed below each film listing.

Take note of the reference page in this manual. This page lists excellent publications and articles that should be referred to for further study and investigation of wetlands.

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What is a Wetland?

The term "wetland" is a very good description of many natural areas that we have here in Florida. Wetlands are a combination of water and land. They are much like a natural water-treatment plant, trapping much of the silt and sediment carried by rivers which flow through the wetlands. Most wetland areas have lush growths of plant life, both trees and grasses.

There are several different types of wetlands. Estuaries, salt marshes, swamps and mangroves make up the largest part of our wetlands in Florida. The amount of wetlands in Florida is amazing when viewed from the air. If one flies over Levy, Dixie, and Lafayette Counties, one sees that swamp black gum, and cypress ponds and swamps cover from 25 to 60

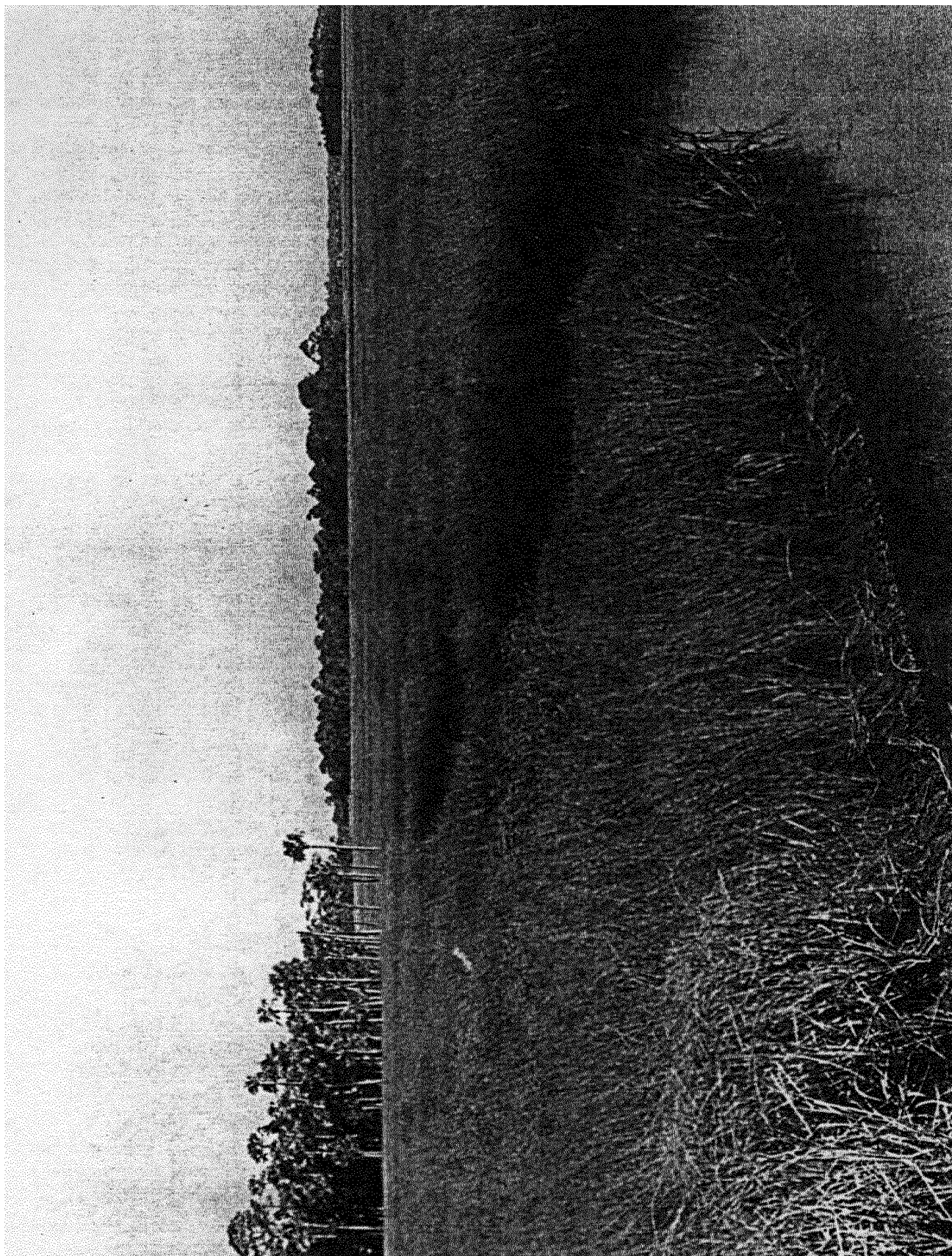
percent of the total land area. Wetlands cover large areas of Wakulla, Liberty, and Franklin Counties. The Big Cypress of Collier County and the Green Swamp of Polk, Lake, Sumter, Hernando and Pasco Counties are major water supply sources. The Suwannee and St. Mary's Rivers are derived from the Okefenokee Swamp in southern Georgia and northern Florida. (*Forested Wetlands of Florida*, June 1977)

Without wetlands, the climate would otherwise produce barren white sandy areas like those at Cape Coral. River and creek swamps have the capacity to absorb heavy floods. Mangrove wetlands bathed with tidal and river exchanges hold the soil, protect against hurricanes, and provide nutrition for fisheries and wildlife.

A "wetland" is then described as "land where water is the dominant factor determining



In tropical areas, such as Florida, many wetlands have dense forests.



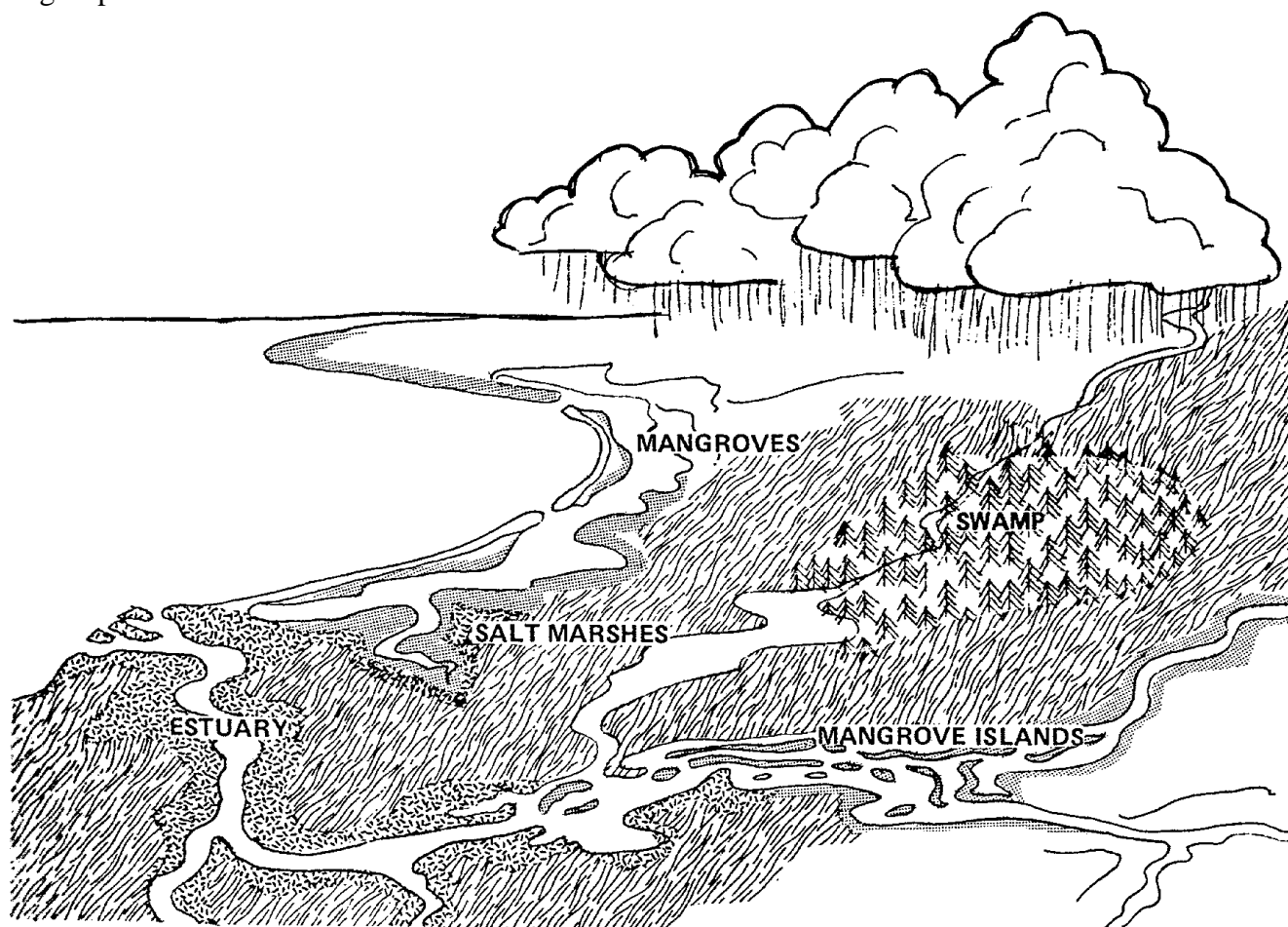
Some wetlands consist of water and grasses.

the nature of soil development and the types of plant and animal communities living in the soil

and on its surface." (Our Nation's Wet lands, 1978)

Fig. 2 Types of Wetlands

There are several different types of wetlands. Estuaries, salt marshes, swamps, and mangroves make up the largest part of our wetlands in Florida.



Importance of Wetlands

Purification Plant

The grasses and trees that grow in wetland areas trap solid particles that are in the water. Many wetland areas are important in the breakdown of organic waste materials, a process which also helps to clean the water. Bacteria, and other microorganisms that live on the roots of grasses and trees, eat and digest the organic wastes that are brought into the wetlands. Tidal action and/or river water carries the cleansed water toward the ocean. As the

water flows nearer the ocean, the tides act as a flushing mechanism, pumping the clean water out into the sea and receiving more river water containing silt and organic wastes. Many wetland areas act as a "purification plant" for the sea.

Nursery

A wetland is a unique hatching and breeding area for many aquatic animals. The eggs of many species of aquatic animals drift into the wetlands. Here, the eggs hatch and the young

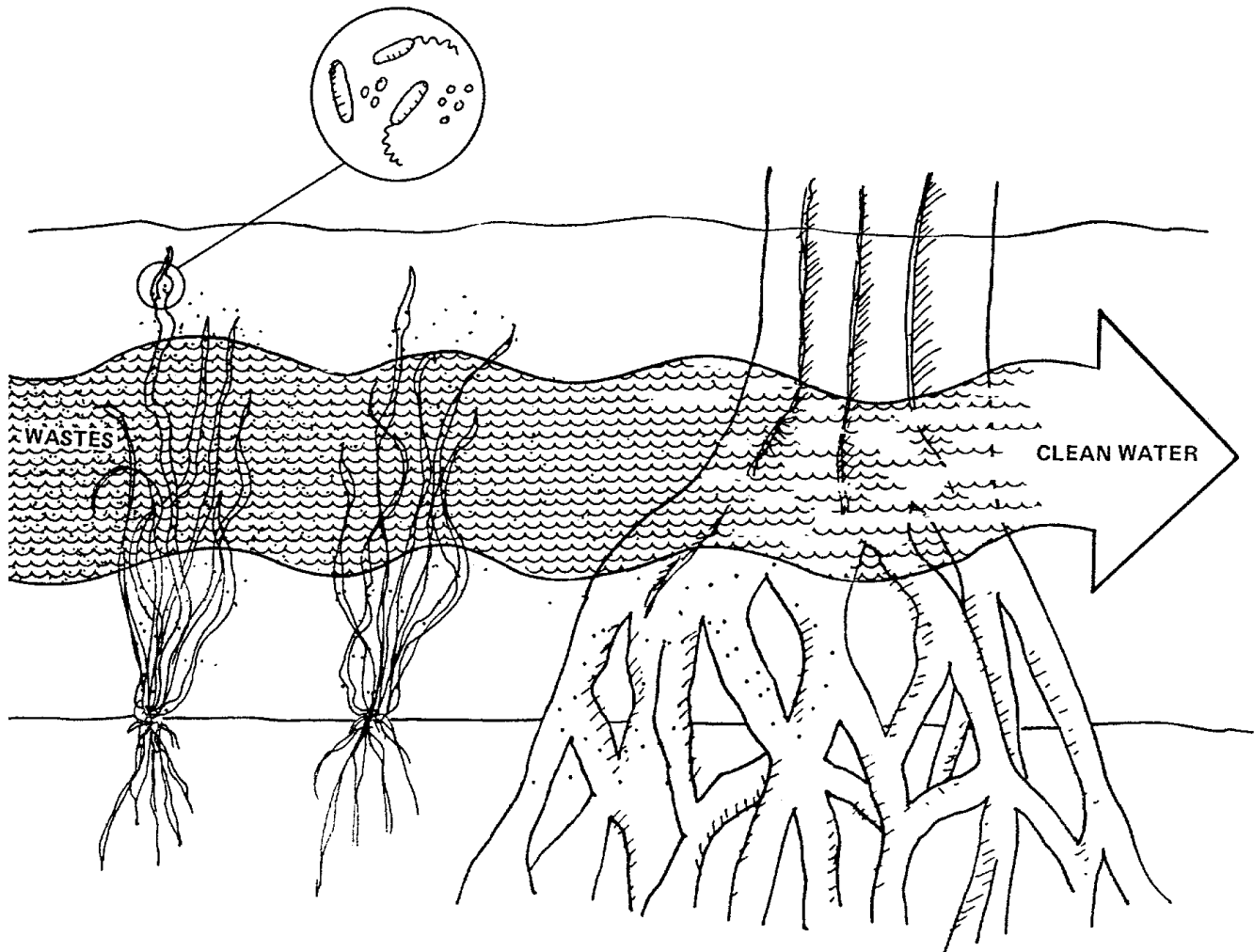


Fig. 3 Bacteria, and other microorganisms that live on the roots of grasses and trees, eat and digest organic wastes that are brought into the wetlands. “An important thing to remember concerning the sea’s purification plant is that anything that destroys an area has a twofold effect. First, it destroys the nursery where so many valuable marine animals begin life, and second, it increases the cost of having clean and unpolluted water since these processes have to be artificially implemented.” (Jacques Cousteau)

grow up. The wetlands provide shelter for these small animals.

The adults of many marine species leave the protection of the wetlands only when they swim to the ocean to spawn. These animals are known as *wetland dependent animals*. Fish, crabs, and shrimp are just a few of the wetland dependent animals. Some fish such as snapper live most of their lives and spawn in the open ocean, but the younger snapper live the first part of their lives in the wetlands. Since the younger are dependent on the wetlands for protection and food, the snapper as a whole are also said to be wetland dependent.

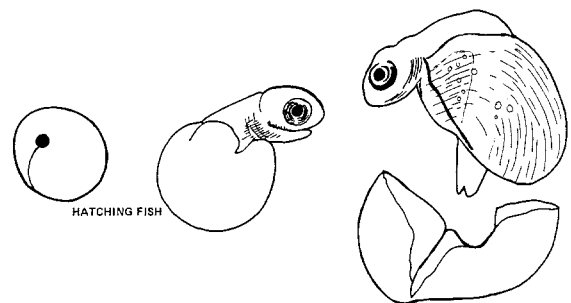


Fig. 4 HATCHING FISH

Both sport fish and commercial fish are considered by many to be a *renewable resource* which is dependent on wetlands. A renewable

resource is one which is produced on a continuing basis so that a new "crop" is available later on. This means that the wetlands are constantly supplying the oceans with shrimp, crabs, lobsters, fish and many other very important marine animals. If it were not for our wetlands, many of the foods we get from the oceans would not be around very long.

Nutrients

Nutrients for plant growth are plentiful in

wetlands from land runoff and from the grasses. Abundant food is available for animals. Grasses such as cordgrass (*Spartina*), turtle grass (*Thalassia*) and eelgrass (*Zostera*) provide homes, protective cover and food for the many different animals that inhabit a wetland.

Wetlands are collecting and dispersal areas for nutrients. Nutrients from the grasses and from the land runoff make up the first (basic) link in the food chain of the wetlands. The basic providers of nutrients in a wetland are the grasses and land runoffs.

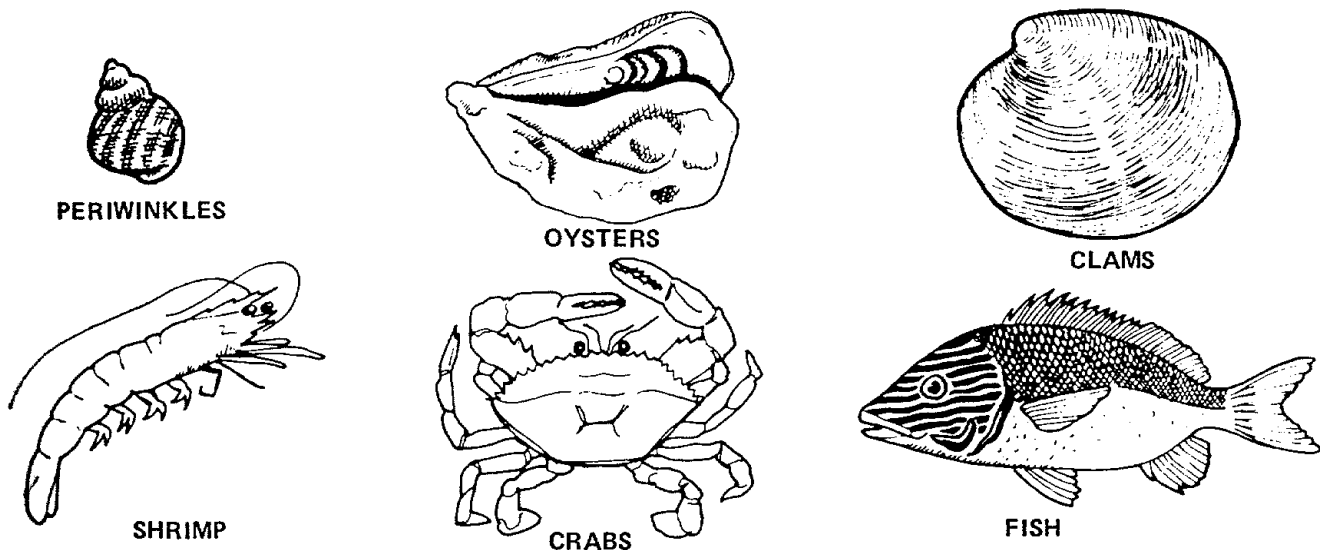


Fig. 5 Many animals that inhabit a wetland are marine. Some examples of animals that live in a wetland are shown above.

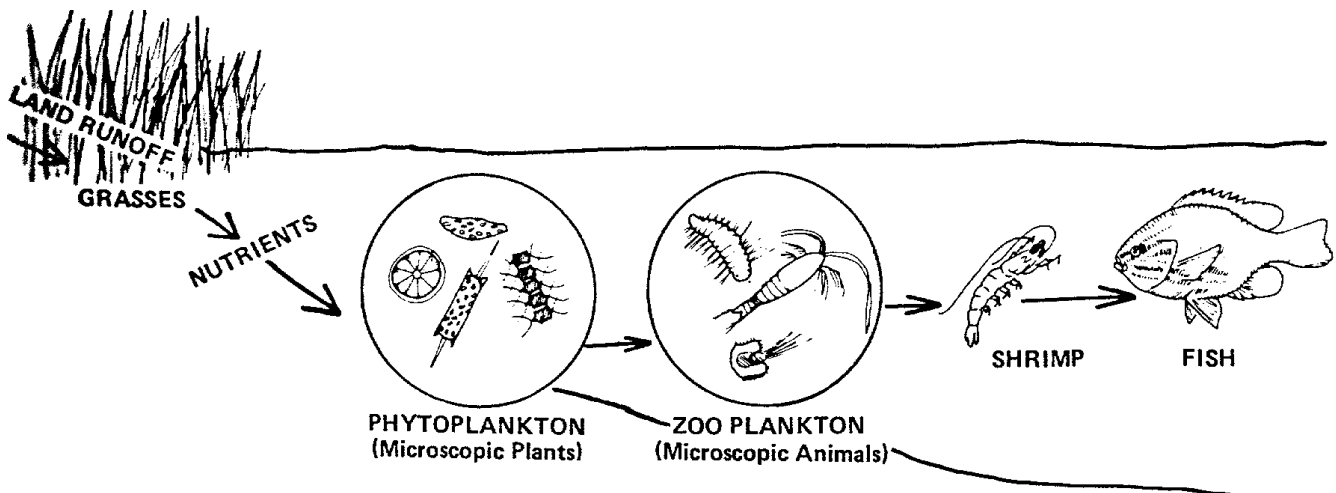


Fig. 6 Wetlands provide protection for marine animals against predators which they would otherwise be encounter in the open ocean. Awetland is an area tha provides unique food webs for fresh, bracksh, and salt water organisms

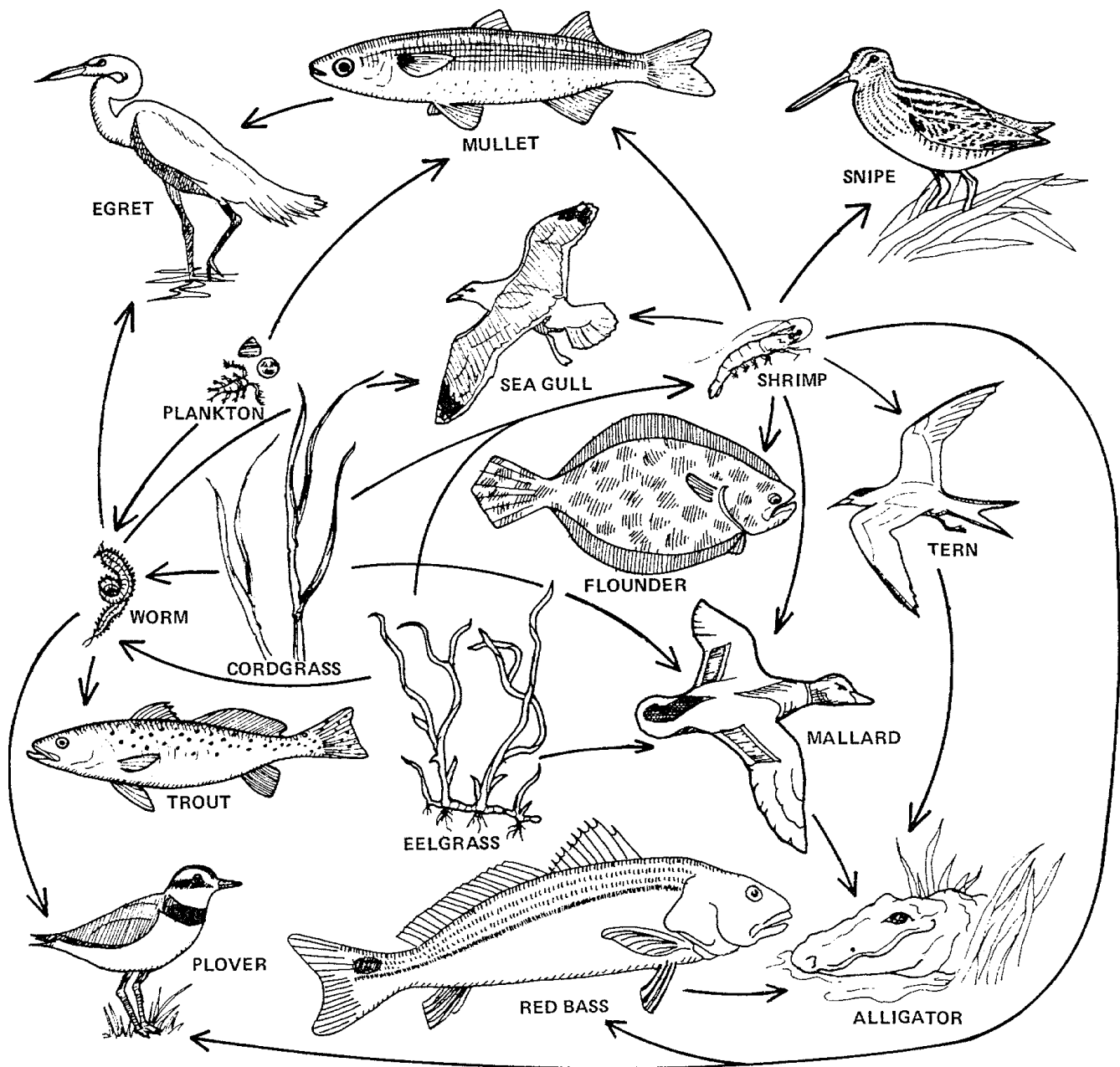


Fig. 7

A food web illustrates the interaction between all of the organisms in a particular environment, such as an estuary, salt marsh or swamp. This is an example of a food web that might be found in a wetland area.

Estuaries

An estuary is an area where the salt water of the seas and the fresh water of rivers and streams meet and mix. As sea water is moved into this area by tides, the saltiness is diluted by fresh water flowing toward the sea. This mixture of salt water and fresh water is often called *brackish* water. An estuary, then, has some characteristics of the ocean and some of the characteristics of the fresh water. It is a very special environment.

Compared to the oceans, estuaries comprise only a small percentage of the total surface of the marine world. Though estuaries are small in size, they are large in productivity. The rivers and streams that drain into an

estuary bring fertilizing minerals (nutrients) from the land. Marsh grasses, mangroves, seagrasses, seaweeds (algae), and microscopic algae (phytoplankton) manufacture food from the nutrients.

An estuary has a rich supply of food, and the built-in protection from the predators makes it a haven for small animals. Some animals such as worms, oyster, mussels and barnacles spend their entire lives in an estuary. Other animals such as shrimp, mullet and blue crabs spend only a part of their lives in an estuary. The rest of the time may be spent in either the fresh water of the river or the salt water of the sea.

The many small animals that live in the protective confines of an estuary will soon grow

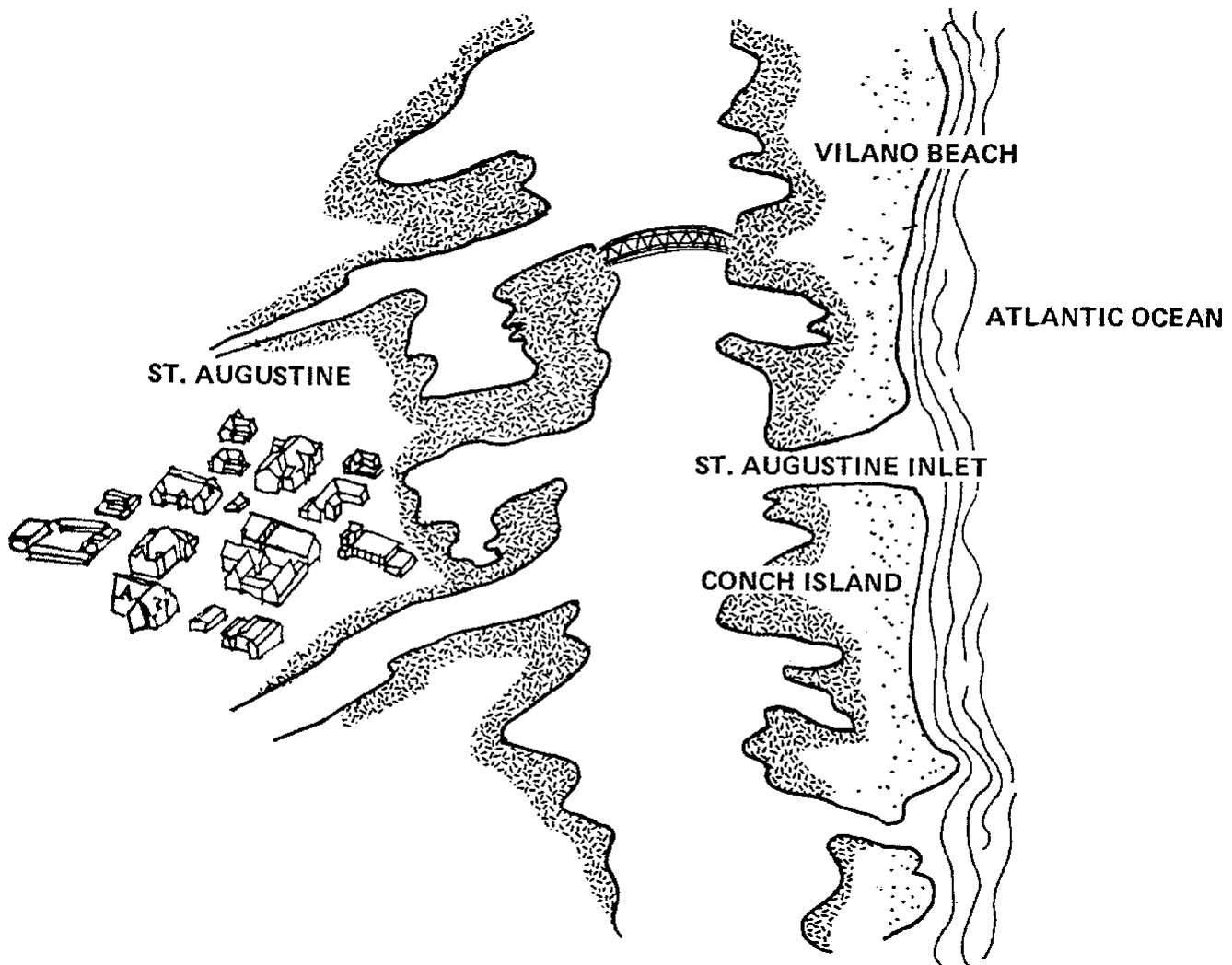
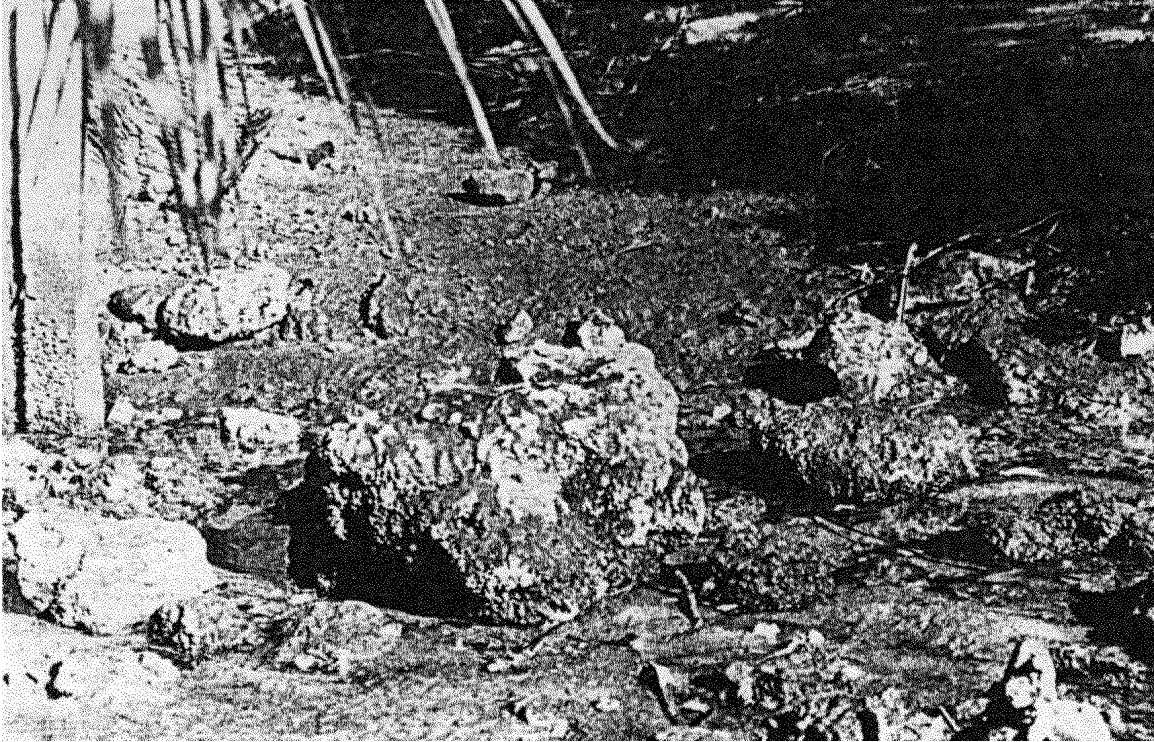


Fig. 8
An estuary along the coast of Florida.



In this small stream which unites with a nearby estuary, the rocks and sandy bottom are exposed during low tide. Rocks and a sandy bottom provide protective cover for shrimp, crabs and worms as well as for many other aquatic animals.



A thick field of cordgrass (*Spartina*) provides food and protection for organisms that inhabit the marsh.

up and become adults. The shallow water and submerged plants provide excellent hiding places from larger, hungry fish. Because so many different kinds of young sea animals live and feed in an estuary, it is often referred to as a nursery.

Salt Marshes

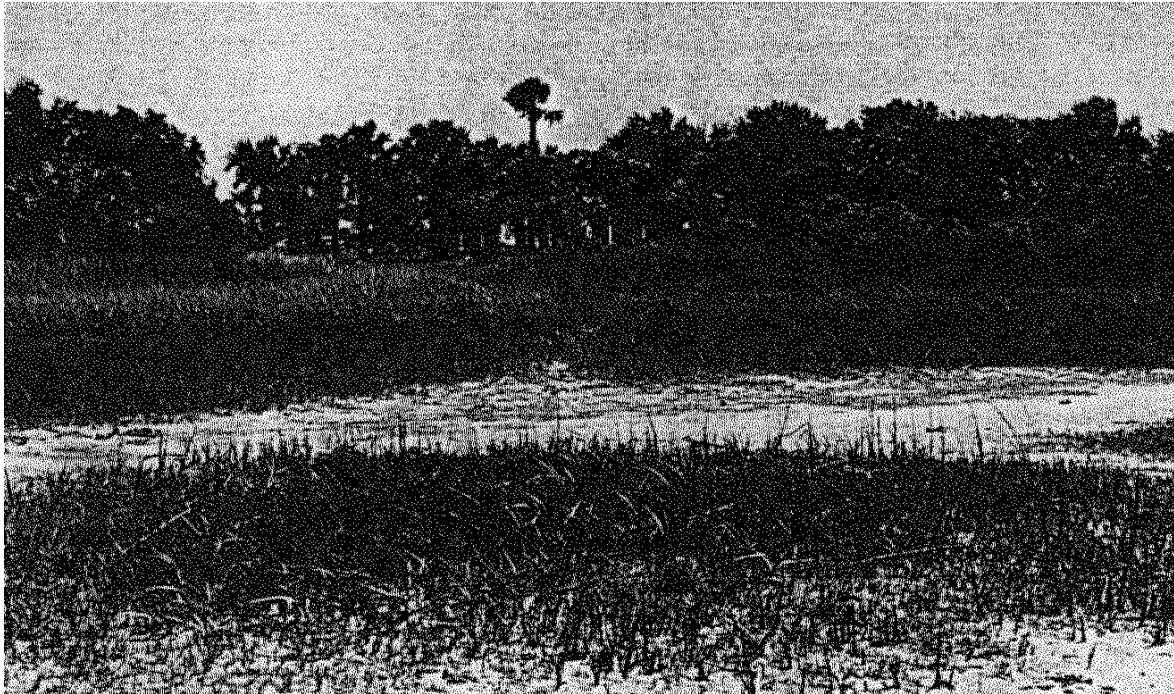
Salt marshes are low coastal lands which are strongly influenced by the tide. Salt marshes are usually covered with marsh grasses called cordgrass. These grasses usually grow up in an estuary where the rising tidal water comes up to cover the flat land. As the tide falls, the marsh land is exposed to the air.

Swamps

A swamp is an area that usually is further inland from the ocean than are estuaries and salt marshes. Swamps are less influenced by the constant rise and fall of the tide. Nevertheless, the tidal water and/or river water which flows through the swamp brings silt and organic material into the swamp. Like estuaries and marshes, swamps are lowland areas saturated with water. Swamps are often mistaken for marshes, and vice versa. Actually, the two are as different as a forest and a prairie. It is quite easy to tell the difference between a swamp and a marsh. The dominating feature of a swamp is trees while that of a marsh is grass.



In a swamp, as in this picture of the Okefenokee Swamp, the trees overshadow the water plants and grasses.



Grassy marshland surround a wooded swamp (hammock).



A dense mangrove forest. Notice the prop roots and the high hanging roots that emerge from the canopy of the trees.

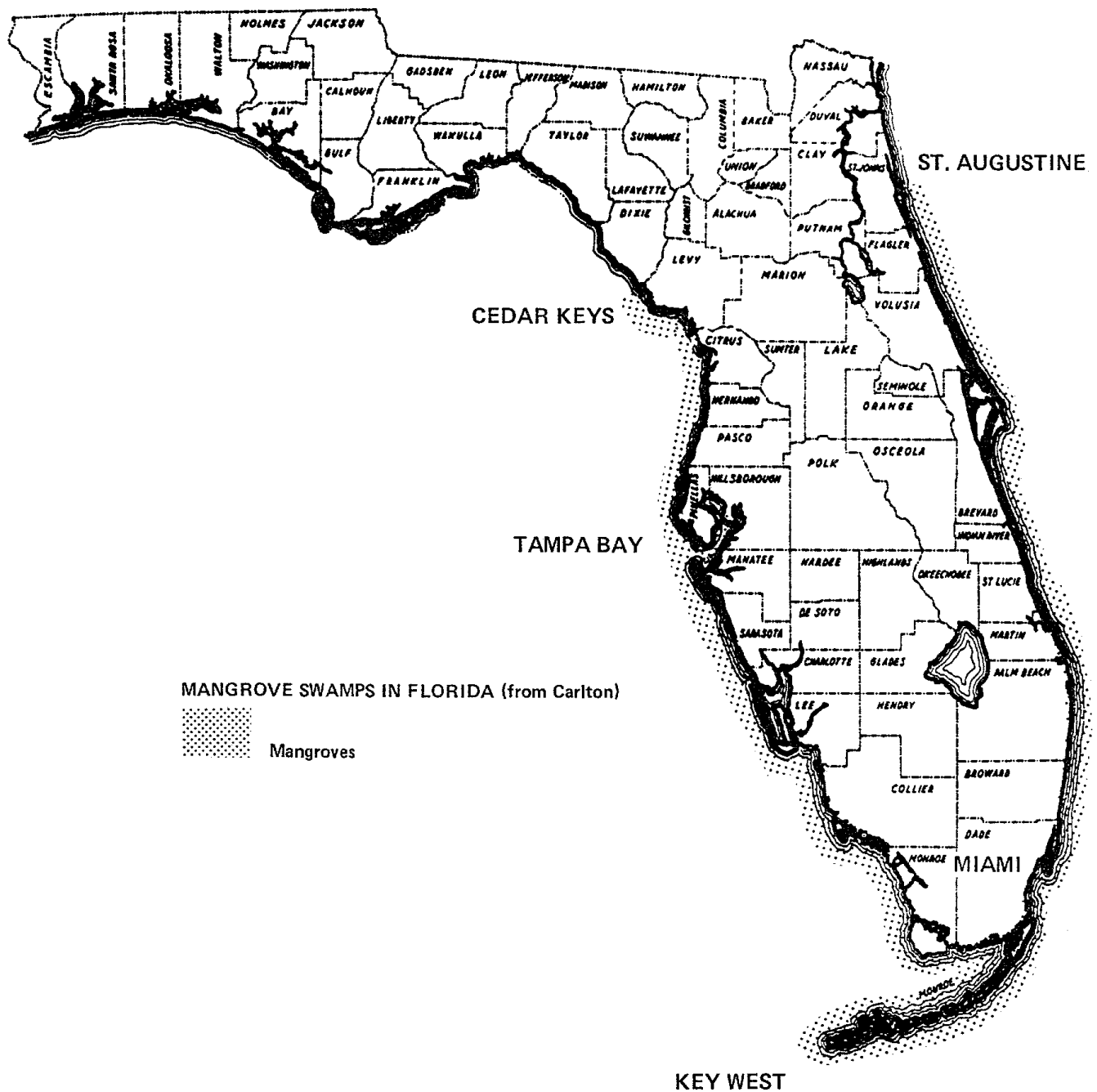
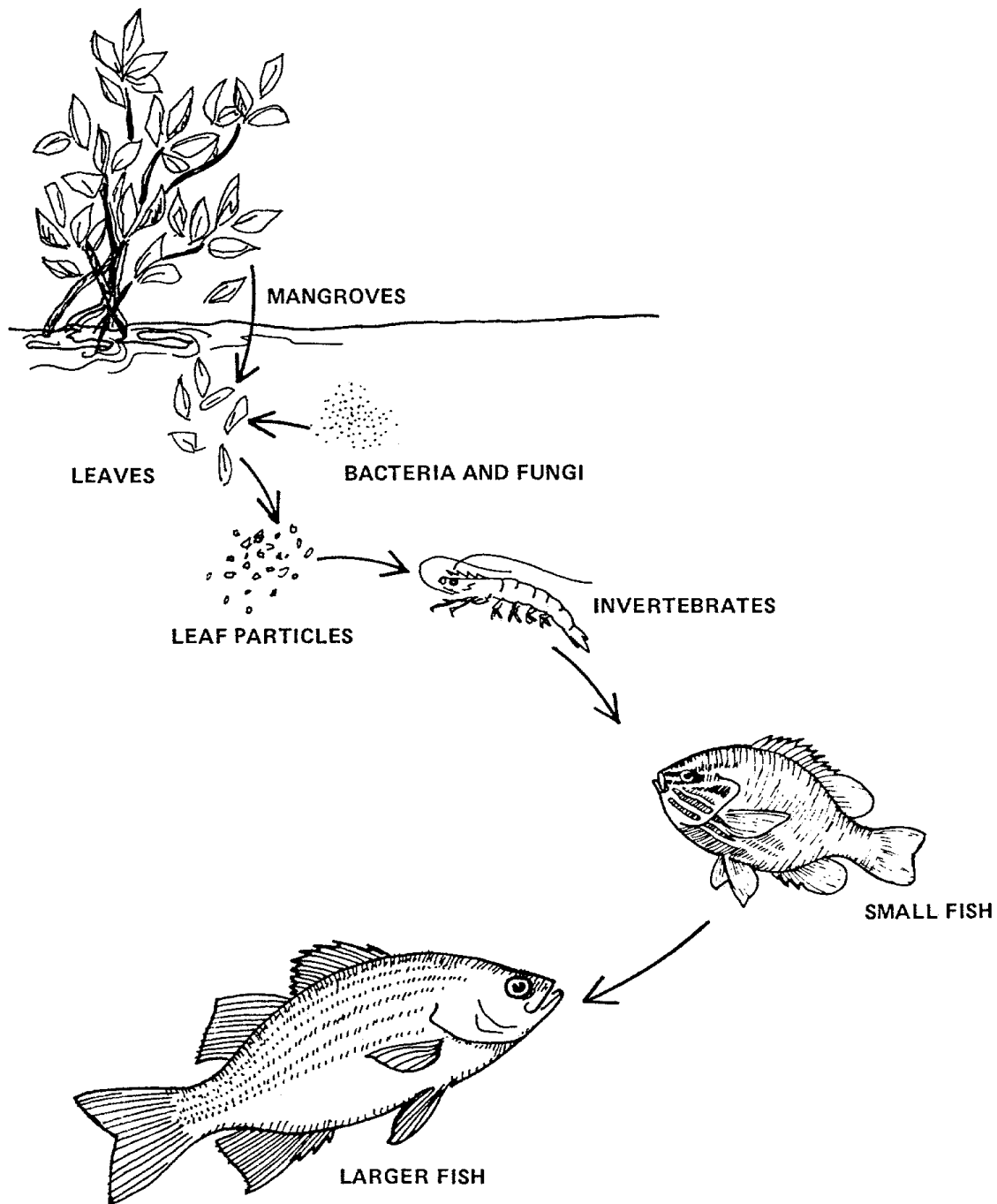


Fig. 9

Mangroves are found on Florida's coastline along canals, lagoons, and bays, and their distribution as scattered islands may take them into rivers and estuaries.

**Fig. 10**

The leaves of mangroves are important, too. When the leaves fall off the tree and into the water, bacteria begin to decay the leaves and break them up into smaller particles that serve as food for small animals. Also, fungi growing on the decaying leaves are eaten by small invertebrates and fishes which, in turn, are consumed by larger animals.

In a swamp can be found plants such as palm trees, oak trees, palmettos and grasses. Alligators, herons, bass, trout, and bull frogs are some the of the animal member of the swamp community.

Swamps and marshes are sometimes very close to one another and usually intermingle. In many place in Florida, marshes encircle wooded islands known as "hammocks".

Mangrove Wetlands

In Florida, mangrove wetlands contain four species of trees that develop swamps in a variety of coastal situations. The four are red mangrove, black mangrove, white mangrove, and the buttonwood (buttonbush). Mangroves are indicators of a salt water environment, and natural stands are never found without salt

water intrusion. Organisms sch as gastropods, crabs, tunicates, oysters, clams, algae, worms, anemones and sponges take refuge on the prop roots of mangroves. It is the roots of the mangroves where small-sized offspring of salt water, brackish and fresh water animals find shelter, food, and a place to grove up.

"By maintaining mangrove intact, man assures himself a multiplicity of free services in the form of food from the sea, forest products, wildlife, panorama, environmental quality, and above all, services in the form of water quality control and protecton from floods, storms and other hazardous climatic events. When taken collectively, these services may outweigh benefits from any other use man can imagine for these areas where mangroves grove." (Forested Wetlands of Florida - Their Management and Use).



Red mangrove roots at low tide. Notice the oysters attached to the roots.

The Florida Everglades

The Florida Everglades is a very large wetland in the southern part of Florida. The Everglades wetlands are sometimes referred to as an ocean of grass. The Everglades is the largest breeding and nursery area for many marine animals in the United States. This area houses one of the largest food webs in the world. The adult marine animals which depend on the Everglades when young are worth several million dollars in our seafood industry.

Rainwater is the main source of water in the Everglades. The water is absorbed in the swamps of the Everglades and seeps into the rivers that flow to the ocean. Large pools scattered throughout the grassy Everglades supply homes for large aquatic animals such as alligators, bass, tarpon and birds.

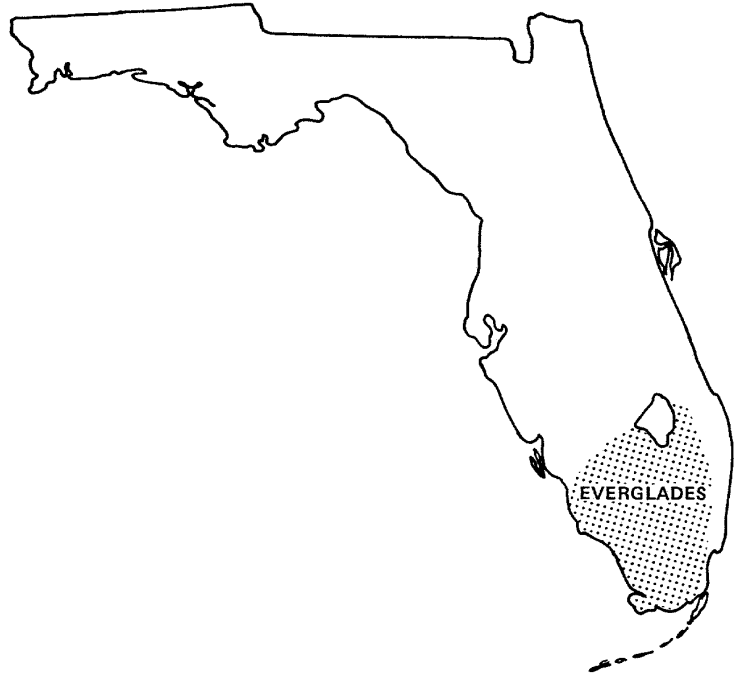


Fig. 11

The Florida Keys

The Florida Keys is another wetland area that provides a place for ocean animals to feed and grow. This area is one of the largest breeding and nursery grounds in the state of Florida. Pink shrimp (*Panaeus Duorarum*) are abundant in the keys. These shrimp spend the early months of their lives in the numerous estuaries and marshes of this region. The

islands of the keys constitute a perfect environment for the shrimp. Many marshland areas of the Florida Keys have been devastated by land fills and dredging. Many areas that once were estuaries and marshes are now places where hotels, motels and mobile home lots stand. While dredging does not totally destroy a wetland, the wetland plants and animals are drastically limited. Plants and marine animals

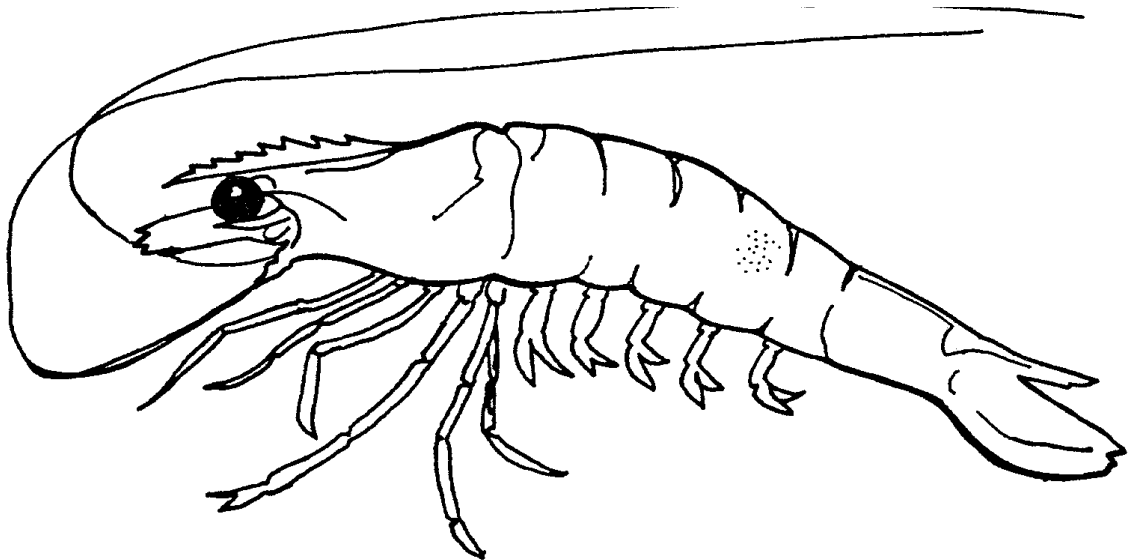


Fig 12 The pink shrimp (*Panaeus duorarum*)

are killed. Larger quantities of silt gush into the rivers and settle on nearby grasslands and coral reefs. As the silt settles, the grasslands and corals are suffocated and soon die.

Wetlands and Landfills

The commercial harvesting of marine animals linked with mangrove wetlands is quite impressive. A study done in 1968 showed that 15.7 million dollars worth of shrimp, 1 million dollars worth of spotted sea trout and 1.2 million dollars worth of blue crabs were caught in one year. These are only a few of the animals that are dependent upon mangroves. Almost two-thirds of the total catch of fish and shellfish in the United States spend a portion of their lives in wetland areas, which is why the wetlands are

often called the "nurseries of the sea."

Wetland swamps, marshes, estuaries and mangroves are being filled in by dredging, clearing out of land, bulkheading, and landfills. These operations greatly decrease the area available to the newly hatched animals. Wetland acreage in the United States has been reduced at the rate of 300,000 acres per year (Pollard, 1976).

Several million acres of the Everglades have been filled in by "land developers." The valuable, swampy ground is scraped and pushed back. Low lying areas are filled in and built up above sea level. This landfill kills grasses and mangroves upon which the marine animals depend. The space that the plants and animals can inhabit is constantly being decreased.

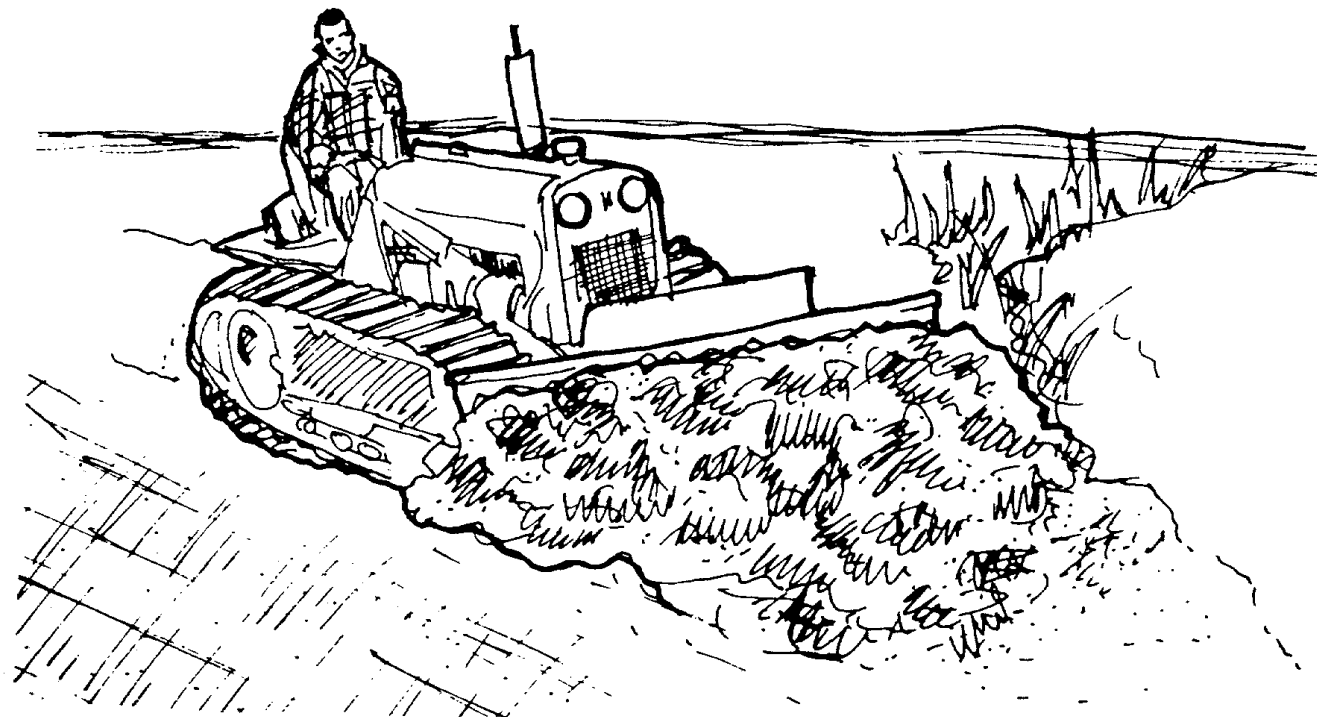


Fig. 13 Covering up our wetlands destroys the home of many plants and animals.

Films for Loan

Estuary (MP 1098) -28 Min., Color. The bays, lagoons, and ends of the rivers, are the estuaries of the United States on which a large percentage of our food from the sea is dependent. Their use by industry, for recreation as well as for food are depicted, stressing the great value of the estuary and the need for planning. (Sponsored by EPA)

It's Your Coast (MP 1043) - 28 Min., Color. Visits Naples, Florida; Portland, Maine; Chicago, Illinois; and Seattle, Washington to discuss coastal zone problems with all kinds of people interested in the coast and coastal zone management. Subjects such as land development, oil pollution, and beach erosion are discussed. Stresses the importance of the coast and the fact that anyone can express a viewpoint during the planning for coastal management. (NOM)

Mail Request To:

Motion Picture Service
Building 116
University of Florida
IFAS
Gainesville, Florida 32611

Estuarine Heritage - 28 Min., Color. Stresses the importance of estuaries for important species such as shrimp, crab, oysters, clams, menhaden, and other finfish; as the habitat of waterfowl and furbearing animals; and as a recreational and esthetic resource. Depicts major threats to estuarine resources: pesticides, municipal methods of conservation.

The Biologist and the Boy - 14 Min., Color. A popularized, shortened version of *Estuarine Heritage*, both of which are produced in cooperation with the five states bordering the Gulf of Mexico. Based on an encounter between a youngster intent only on fishing and fun, and a biologist who shares with the boy his more knowledgeable perspective and sense of responsibility for conservation. Distributed theatrically as *Crisis on the Coast*.

Mail Request To:

Motion Picture Service

Department of Commerce - NOM
12231 Wilkins Avenue
Rockville, Maryland 20852

Big Cypress, Partnership with Nature - 17 min., Color. Deals with the Big Cypress swamp in Florida, which is an exotic haven for fish, birds, and creatures rarely seen. It is also the site of an oil discovery. The film takes a look at the successful efforts that are being made to preserve the wild beauty of the swamp, while tapping the area's much-needed energy reserves.

Mail Request To:

EXXON Company
Modern Talking Picture Service
2323 New Hyde Park Road
New Hyde Park, N.Y. 11040

Islands of Green - 24 min., Color. Shows how the National Audubon Society is helping communities across the country establish nature education centers, to counteract the influences of a totally man-made environment. People isolated within cities are led to see nature around them and to understand it with an awareness, appreciation, and affection for the natural world and to enjoy and preserve what land remains.

Mail Request To:

ASSOCIATION FILMS, INC.
866 Third Avenue
New York, N.Y. 10022

or

ASSOCIATION FILMS, INC.
5797 New Peachtree Road
Atlanta, Georgia 30340

A Living Lake - 14 min., Color. Chemical and biological studies of Lake Okeechobee. Features the scientific work of the South Florida Water Management District in protecting and monitoring Lake Okeechobee which is the heart of the water supply for all of South Florida.

Mail Request To:

South Florida Water Management
District

P. O. Box 5
West Palm Beach, Florida 33402

Billion Dollar Marsh - 45 Min. (long version) 26 Min. (short version). Stretching over 2,500 miles from Maine to Florida lies one of the greatest areas of marshland in the world. To developers, these marshes are so many thousands of wasted acres that could be drained for housing and industry; to others, the marsh must be preserved as is. This film, shot in the wetlands of New Jersey, Virginia and Georgia, explores the conflicting points of view.

The Salt Marshes - The importance of the salt marsh and the role it plays in the delicate ecosystem is

depicted in this film. How a marsh is formed and the variety of plants and animals that inhabit the marsh are also described.

Mail Request To:

VIMS/SEA GRANT MARINE
EDUCATION CENTER
Virginia Institute of Marine Service
Gloucester Point, Virginia 23062

804/642-2111, Ext. 111

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1. This document is 4HMER70, which supersedes 4H365, one of a series of the 4-H Youth Development Program, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Date revised September 1981; reviewed, January 2009. Please visit the EDIS website at <http://edis.ifas.ufl.edu>.
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